

GRUMMAN

plane news

Vol. 32, No. 10, Bethpage, N. Y., May 25, 1973

Shareholders meeting —

'Tougher new business line' reported by Clint Towl

The climate was quite different this year at the annual shareholders meeting of Grumman Corporation held on May 17 in Plant 4. Unlike last year, there were few complaints about the heat and stuffiness of the air inside the plant; a gentle breeze coming through the open hangar doors kept the huge auditorium and its more than 800 occupants comfortable. Moreover, the clouds of uncertainty—primarily those dealing with the F-14 — which dominated last year's meeting were essentially removed. The over-riding tone this year was that of confidence and optimism.

The speakers tackled everything from the F-14 settlement to the Company's newest commercial innovations:

"With the means to satisfy our financing requirements at hand through the advanced payment agreement," Board Chairman Clint Towl told the group in summarizing Grumman's agreement with the Navy over the F-14, "we reached a settlement which allows us to continue producing this great fighter, and eventually to achieve the normal profit goals of a long term program that can provide our military with their first line of defense."

As part of the formal meeting, the shareholders re-elected five members on the board of directors: Joseph G. Gavin Jr., president Grumman Aerospace; Harry S. Howard Jr., president, American Can Company; Charles E. Dunbar, chairman, Discount Corporation of New York; David L. Grumman, professional engineer; and George F. Titterton, retired senior vice president, Grumman Corp.

Focus on subsidiaries

The focus this year was on the six Grumman subsidiaries: Aerospace, Allied, American Aviation, Data Systems, Ecosystems, and International. Instead of one or two senior executives reporting on the status of the parent Company as a whole, or on some of the high points of the year, the president or chairman of each subsidiary discussed his company's products, pro-

gress, and its most promising areas for growth.

First on the roster of speakers, though, was Clint Towl, who confined his remarks to the F-14 program. "As you know," he told the shareholders, "I had previously stated that acceptance of orders beyond the fourth lot would be impossible in view of the losses that would be incurred. At the time of that statement, Grumman Aerospace Corporation had lost its unsecured line of commercial bank credit and there appeared to be no way to finance any further loss. I said, in fact, that if we had to accept additional orders for the F-14 under the original terms of the contract and the sizable financial loss that would follow, we would be forced to close the Aerospace subsidiary's doors."

Changing priorities

Subsequently, he pointed out, Grumman was able to enter into an advanced payment agreement with the Navy that provided the necessary financing for daily operations without commercial credit. He said that one of the alternatives was that of going to court and fighting for an equitable settlement which was "no answer" and "which might well have resulted in the termination of the program."

Towl added: "Over the past few years, we have learned a great deal about changing national priorities and the changing face of the aerospace industry, and we have taken stringent steps to adjust to what might be called the tougher new business line. We have trimmed, and we are continuing to trim, our workforce down to absolute requirements. We have consolidated our facilities to the point of maximum usage, and we have reassigned some of our key management personnel in a continuing effort to obtain the most effective application of their talents."

President Jack Bierwirth commented on the financial loss to the Company resulting from the F-14, the consolidated loss of more than \$70 million

(Continued on page 3)



F-14 crew from Miramar to fly in Paris Air Show

PATUXENT RIVER, MD. — They were sitting in a crowded flight shack, munching on cold hamburgers and sipping milk from a container. Pilot Jim Taylor and his Naval Flight Officer Kurt Strauss were unwinding . . . and you could sense that the two Vietnam veterans were looking back over the past couple of hours with satisfaction.

The two, now assigned to VF-124 at the Naval Air Station at Miramar, California, are scheduled to demonstrate the Navy/Grumman Tomcat at the Paris Air Show early in June and were at Patuxent for a couple of days of aerobatic practice. Earlier that morning, residents of Maryland's western shore near here got a preview of the flight demonstration being prepared for the Paris show as Taylor and Strauss put the F-14 through a series of rolls, climbs, inverted runs, and associated maneuvers to show off the Tomcat's handling and maneuvering qualities. It was impressive.

Commander Taylor, a cigar-chomping fighter pilot, has flown off just about every attack carrier in the Navy while racking up some 3,000 hours in the F-8 Crusader. Since last October he's been at Miramar where he and many other Fleet pilots are getting their introduction to the Navy's newest bird, the Grumman Tomcat.

Lieutenant Strauss, a Naval Flight Officer who is weapons system officer on the F-14, has more than 1,000 flight hours, most of them in the F-4 Phantom. He's been flying as NFO in the F-14 since January.

'Piece of cake'

While munching their nose-bag special, Taylor and Strauss were trying to make the most of the last couple of hours at Patuxent before departing for Pensacola. With them was Chuck Sewell, chief test pilot for Grumman, who came to Patuxent to observe the demonstration and to answer any last-minute questions the two might have. Also at the table were Grumman base manager Jim Russell and several of the service crew at Patuxent, just in case there were any aircraft "crabs." "That inverted pass looked good," said Sewell, "Yeah," said Taylor, "we had no problems at all during the entire run . . . piece of cake. Although Kurt did look like he was hanging on when we pulled 6½ Gs during our 360 degree turn," he added with a grin.

Strauss had a busy time of it during the demonstration. He was monitoring communications, feeding Taylor altitudes, air speeds, and the sequence of maneuvers, and "timing every one of them, cause we're going to be on a tight schedule in Paris."

"I timed the 360 turn in less than 20

seconds," Strauss said. Sewell checked that against times that he had recorded on the ground, and for the next 15 minutes or more, that's the way it went. The three men exchanged observations on the various maneuvers, determined which were most effective for the exhibit, checked times, examined flight and landing patterns and various other regulations provided by the show committee, and tried to make sure that the F-14 demonstration would fit into any time frame between 4½ and six minutes.

Hectic pace

It was the start of a busy two weeks for the Tomcat crew from Miramar. Taylor and Strauss drew the duty to fly the F-14 to Pensacola last weekend, practice in-flight refueling with a KC-135 tanker, and last Monday, the F-14 team and the Navy Blue Angels flight demonstration team flew together non-stop to Spain, with a couple of drinks from accompanying aerial tankers to ease the long jump. After a week's training near Madrid, the F-14 was to head to Paris and get its world preview before an international crowd on June 1 and 2.

And Taylor and Strauss can hardly wait.

Of course, they're kind of proud that they were selected to fly the Tomcat at Paris—after all, it is a Fleet air crew and a Fleet aircraft.

But more important, both felt the Paris exhibit was a decisive step toward blunting the "Proxmire syndrome," as they call it, in which everybody believes the worst of the plane. "We're grateful that Admiral Snead has given us the opportunity to prove that it's the world's finest fighter," Strauss said. "And when you think about it," Taylor emphasized, "nothing is projected for the next eight years or so that will even match it."

Commander Taylor and Lieutenant Strauss left no room for doubt: they think the F-14 is the greatest thing to ever come down the fighter pike.

Listen to J. W. Taylor:

"This airplane is so honest that nobody's afraid to take it to its limits because you know what it will do. There won't be any surprises. And after a couple of flights in it, you feel so comfortable flying it that you're ready for tactics and advanced training. That's just not possible with other fighters—you can depart and spin if you don't watch it."

"It's an entirely different world for an NFO in the F-14," said Kurt Strauss. "The biggest thing is visibility—and I don't mean just seeing out the canopy. For the first time you get a better picture of what's going on around you—the displays and other information and inputs enable you to



make better tactical decisions. For instance, the radar increases detection of fighter-size targets by about 150 percent over existing fighters.

"And the weapons mix. Flying the F-4 against a MiG is like a giant with a big club in a phone booth trying to fight a midget armed with a switchblade. You can't always maneuver to fire mid-range missiles.

"With the F-14," Strauss continued, "it's a different ball game. 'You have long-range, multiple-shot capability with the Phoenix, or close-in firepower with the Gatling gun.'"

"Yeah, that AWG-9 and Phoenix are 'supernatural,'" said Taylor. "And when you consider the tremendous range of the Tomcat—you can stay airborne easily 3½ hours—you can go out on a mission, recycle, make your approach, and still have plenty of fuel left after you're aboard.

"And the F-14 is effective. Normally, when you have a practice hassle with F-4s or F-8s," he continued, "you start by coming at each other nose-to-nose. But with the F-14, that's too easy so we let the other plane start behind us at 6 o'clock, and within one turn,

maybe 1½, we're on his tail."

"The real problem," added Strauss, "is that we don't have any plane that's a real adversary for the F-14—it's difficult to find out just how good we really are."

'Super airplane'

There are still more pluses, according to Strauss. "It has tremendous flexibility from several points of view:

- Design—variable wing sweep
- Weapons mix—long- and short-range armament
- Avionics — navigational and sophisticated flight systems
- Maintainability — on-board checks for radar and avionics systems"

"And we haven't even reached our full flight envelope yet," Taylor was quick to add. "It's easy to fly, has long legs, multi-mission capability, and it's a helluva lot easier to maintain than anything before; it's easy to understand why we feel the Tomcat is a super airplane."

J. W. Taylor and Kurt Strauss think that flying the Tomcat at Paris is the best assignment in the Navy. Now you know why.

Cite growing diversification among subsidiaries . . .

(Continued from page 1)

after tax credits on consolidated sales of over \$686 million and a loss per share of \$10.26.

"We should take a look at what this means to the Grumman Corporation now," Bierwirth said. "Since we have anticipated the losses that we will sustain during 1973 and 1974 while the F-14 is being produced at the old contract price, we do not expect to show either a loss or a profit on those F-14 sales during that period of time. The rest of Grumman's business in the aerospace subsidiary, and to a great extent in the other subsidiaries, is profitable."

Bierwirth said that at this time the Company is in the midst of a struggle in three significant areas:

- "The Aerospace subsidiary must be able to demonstrate that it is an efficient, low-cost producer of the F-14 so that new contracts can be entered into at reasonable prices. . . .

- "The Data Systems subsidiary is perfecting its MASSTAPE unit and is near the end of a long period during which people have worked night and day to prove out a product which means so much to both that subsidiary and the company as a whole. . . .

- "In Grumman Allied, the motorhomes production team is making every effort to bring its product into a solid, steady production position so that the backlog of sales can be fulfilled, and we can enter this important market with a strong Grumman-quality product that is available in good volume."

Bierwirth also cited the "interesting development work" now in progress in the medical equipment field and said that with "further developments, we have every hope that the end result will permit the formation of a separate subsidiary."

At this point, Bierwirth turned the dais over to the heads of the subsidiaries, with Grumman Aerospace Chairman Joe Gavin as first speaker.

Aerospace . . .

Gavin reported that Grumman Aerospace produced 85 percent of Grumman Corporation sales and that all programs in Aerospace are progressing in an orderly and profitable manner.

"At this point, no one disputes the demonstrated evidence that the F-14 is a truly outstanding flying machine equipped with the unparalleled Phoenix weapons system," Gavin said. "We are now virtually completed with the development program and are phasing into production. Airplanes Nos. 28 and 29 are currently in predelivery flight status; parts and subassemblies are in various stages of manufacture for the remaining 107 aircraft under contract. The Navy is 100 percent behind this program."

In addition to the F-14, Gavin noted the progress in three other major Aerospace programs: the EA-6B, which "has progressed into service and into continuing development in a very well organized fashion"; the E-2C, the third and most modern version of the Hawkeye airborne early warning aircraft, whose production deliveries start this year; and the A-6 attack aircraft which continues along two paths: new A-6E aircraft and a modification program for converting earlier versions of the A-6 to the modern A-6E configuration.

Gavin also commented on the Company's continuing relationship with NASA, discussed the completion of Grumman's responsibilities with the Lunar Module and the Orbiting Astronomical Observatory contracts, and the recently awarded subcontract from Rockwell International for the design and development of the Earth-to-Orbit Shuttle wing.

"We are proceeding into 1973 with a group of products which are soundly designed, which are either in service or entering service, and which, because of their unique capabilities, hold the promise of long service lives," Gavin concluded. "We are also at the point where we are entering a period of stabilization after the unsettling experience during the months of the F-14 contract controversy."

Allied Industries . . .

Grumman Allied Board Chairman Wallace Spielman commented on the steady advances his company is making toward meeting its growth objectives, adding that "there is still a long way to go before we accomplish the ambitious goals we have set for ourselves."

Total sales for the subsidiary, he said, reached over \$34 million compared with nearly \$28 million the previous year—an increase of 23 percent. Earnings totaling more than \$1.2 million, or \$1.34 per share, constitute an increase of 86 per cent over the previous year. "All of the company's operations contributed substantially to the sales and earnings totals," Spielman pointed out, "except the modular buildings division and the motorhome division."

Spielman said that Grumman Allied anticipates substantial gains for 1973. Among the promising product lines he cited are:

- Motor homes, by which the subsidiary is now able to "serve the entire motorhome buying public from the economy-minded family to the luxury-seeking retired couple."

- Truck bodies, which in 1972 set records in production, sales, and earnings, and now enjoying the highest backlog in its history.

- Grumman canoes, which produced the highest number of canoes in

its history and set records with its backlog of orders.

- Pearson Yachts, which now has nine boats in its product line—eight auxiliary sailboats, one costal cruiser, and which also enjoy the largest backlog in its history.

- Wormouth Brothers Foundry, one of Allied's smaller divisions, which had a record sales year in the mold-making field.

Grumman American

President Russ Meyer opened with a report on the formation and growth of Grumman American Aviation, an 80-percent-owned subsidiary of Grumman Corporation.

Sparked by the increase in overall general aviation aircraft sales, he said, and an aggressive marketing effort, American delivered over 450 single-engine airplanes during 1972 and anticipates an increase to over 600 units

in 1973. These airplanes include the two-place Trainer, the TR-2 high-performance sports plane, and the recently introduced four-place, single-engine Traveler.

Meyer also said that in a bid to become a larger factor in the general aviation market, Grumman American design teams have programmed a number of innovative ideas to meet the need for high-performance, single-engine and light twin-engine aircraft. In line with this growth, Grumman American has established "Grumman American Flying Centers" to offer student pilot training through American dealers nationwide and overseas. This will make student flying inexpensive, easy and complete, and will include the latest state-of-the-art, audio-visual simulators for ground training.

Gulfstream II sales, said Meyer, exceed the forecast for '72, so production has been increased from 15 to 18 a

(Continued on page 5)

Career day for students



More than 200 high school students, teachers, and administrators from Long Island communities visited Bethpage on Friday, May 18, to take part in the Company's first Career Day Program.

In his welcoming talk, Jake Busolini, director of Administrative Operations, explained that "The program was set up to bridge any possible communication gap between the Company and those students who have the desire to pursue careers in engineering or supporting fields in the aerospace effort. Our future depends on the influx of young, new, dynamic talent," Busolini later added.

While viewing the exhibits from

the Annual Shareholders meeting, the students had individual talk sessions with guides representing Grumman Corporation subsidiaries and other areas of the Company, who explained as well as demonstrated their displays.

Following a film: "No Points For Second Place," tracing the history of fighter plane development, the program was adjourned by Bill Wenzel, administrator of the Engineering Scholarship Program.

Materials were made available to the students concerning the Grumman Engineering Scholarships that have been awarded to graduating seniors each year since 1944.



L. Fontana



E. Haas



F. Vitale



T. Flynn, Jr.



H. Suydam



A. Bellion



V. Vashel



A. Loiko



W. Post

service milestones

35

Paul J. Holm, Inventory Control (30)
John C. Geiger, Requirements & Planning (30)
Henry Ruppenthal, Sub. Assy. (36)
Milton Keitel, Inventory Control (36)
Harold A. Kirvin, P/S A/C Sys. Serv. (80)
Robert W. Thompson, P/S A/C Sys. Serv. (88)



P. Holm



J. Geiger



H. Ruppenthal



M. Keitel

Louis M. Salerno, Product Plt. - Mgmt. & Staff (3)
Joseph W. Kucera, Trans-Operations (20)

30

20

Edward J. Murray, Maint. Rearrangement (1)
Charles P. Ryan, Marshalling & Fin. Tl. Cont. (2)
Charles M. Manning, Tech. Services & Subcont. (2)
John S. Gibson, Maint. Indust. Control (5)
Validore A. Castagna, PPO - A6 & Misc. (25)
Joseph H. Peretti Jr., Fluid Power (25)
Steve A. Bachmann Jr., Sub-Assy. (27)
Daniel D. Carey, Contractor Maint. Serv. (75)
Joseph D. Seiler, Prototype (1)
Theresa J. Johnson, Grumman Corporation

Emil J. Mikula, Proj. Veh-Tech. (1)
Lawrence S. Smith, Conventional Machines (3)
William Kowalsky, Conventional Machines (3)
Gerard R. McClorey, Power Plant Des. (5)
William J. Goss, Flight Sciences (7)
Frederick T. Main Jr., director, Mat. & Proc. (12)
Thaddeus A. Lombarski, Maint. Rearrangement (27)
Anthony Gorski, Maint. Rearrangement (27)
Doris Anderson, Inventory Control (30)
John O. Alvar, Procurement Mgmt-Mgmt & Staff (30)
Richard T. Seidler, P/S Electrical Engg. (34)
Carmen G. Barbato, Oper. Plng. & Budgets (34)
Leonard J. Cuccaro, Grumman Corporation
Carmine Lagnese, Grumman Corporation

Leonard F. Sears, Conventional Machines (3)
Henry W. Parke Jr., Q.C. Quality Eng. (3)
Carl P. Hellsten, Aerodynamics Staff (5)
Stanley B. Burns, Structural Analysis (5)
Rosalie L. Costa, Secretarial Serv. Staff (5)
Newton E. Spiess Jr., director, Prod. Eng'g. (5)
Francis D. Bonino, Configuration/Data Mgmt. (5)
Charles E. Martin, P/S Resource Application (6)
Paul C. Sachse, Safety. (6)
Edward W. Magee, Plant Protection (6)
Eugene N. Opinante, P/S Commodities Controls (34 F)
George J. Gru, B/P Warehouse (21)
Anthony A. Oddo, P/S Verif. & Prod. Support (25)
Charles H. Cohen, Equipment Lines (25)
Wilfrid R. Howell, Proj. Plan. (25)
John T. Pierce, Sub-Assy. (27)
Herman Ulmer, Maint.-Facil. Equip. & Gen. (27)
Marion J. Opfer, Corporate Security (28)
Ronald Hannington, Machined Parts/Raw Material (30)
Joel H. Taft, P/S Mech. Engg./Design (34)



H. Kirvin



R. Thompson

Richard H. Melchers, P/S Tech. Services (34)
Paul T. Bell, Environ. Control Des. (34)
Vitold Ludkowski, Drafting (34)
Joseph A. Metro, Specifications (34)
Lawrence J. Hahn, Proj. Eng'g Ops (34)
James R. Coyne, Structural Design (35)
Arnold Bruno, Environ. Control Des. (35)
Charles H. Rohrs, Alg. & Gr/Arm Pyrotech Sys. (35)
George Ulrich, Jr., Sub. Assy. (36)
Henry M. Canle, P/S A/C Sys. Serv. (75)
Charles F. Askins, P/S A/C Sys. Serv. (80)
David J. Ramsay, Production (88)

25

15

Ralph J. Cirone, Fuse Fwd. Sub. & Major (1)
Salvatore F. Comitino, Small Parts & Fab. (2)
Frederick Groll, Parts Paint (2)
Lawrence Fontana, Steel Parts Assy. (2)
James J. Reilly, Stress Relieve & Hot Form (2)
Salvatore J. Palazzolo, Prod. Ctl. - Parts Ctl. (2)
Edward W. Haas, Small Parts & Fab. (3)
Francisco Garcia, Engraving (3)
Robert D. Urey, Engraving (3)
Fred F. Vitale, Plant Stores (5)
Thomas Flynn Jr., Value Engineering (5)
Henry B. Suydam, Ops. Anal. & Plng. Research (5)
Arthur H. Bellion, Machine Shop (6)
Vincent Vashel, Maint. Rearrangement (12)
Alexander Loiko, Trans. - Operations (20)
William D. Post, Sub-Assy. Major (27)

Charles J. Randazzo, Fuse Fwd. Sub. & Major (1)
Alfred C. Norris, Methods Engg. (1)
Ralph H. Aponte, Avionics Mgmt. & Staff (1)
Edward Sprague, Maint. Rearrangement (1)
Edward W. Jelich, Fluid Power (1)
Francis A. Schaum, Small Parts Fab. (2)
George Panzera, Hydraulics (2)
Stanley G. Orme, EBW Final Assy. (2)
Raymond Hoene, Prod. Release & Analysis (2)
Doris M. Sellers, Prod. Mfg.-Mgmt. & Staff (2)
Michael G. Kornely Jr., M. E. Productivity (2)
James P. McGuirk, Insp-Mechanical (2)



On tour. West Point cadets toured the F-14 production line in Plant 1 recently to get a better look at the air superiority fighter. Several of the 28 first classmen who visited Bethpage have been assigned to flight training following graduation this June.

GRUMMAN, May 25, 1973

Report to shareholders . . .

(Continued from page 3)

year for 1973. The total jet Gulfstream fleet now numbers 124. With the Gulfstream Service Center and Gulfstream simulator training situated at Savannah, and customer maintenance training conducted there also, Savannah is a very vital link in the Grumman American corporation.

And the Ag-Cat goes on and on, with 142 of the doughty biplanes—largest every for a single year—sold during 1972.

Data Systems . . .

GDS President Bob Nafis said the subsidiary had its third successive year of profitable operation in 1972. He noted that while GDS has a substantial business with other Grumman subsidiaries, it also has made "significant progress in the development of commercial sales, doubling them each year."

The four areas which are receiving most attention at GDS are:

- Information processing in which GDS acts as a service bureau for its customers.

- Equipment, in which the firm's major investments are MASSTAPE, a large capacity automatic retrieval tape library system, and the automatic digital pipette.

- Application programming and systems design for which GDS has been marketing its telemetry and processing system to the Air Force and other government agencies.

- Data base services, primarily with the New York Telephone Company, which is a mechanized assignment and inventory system (MAIS) utilizing the GDS computer.

Nafis said in summary: "Our commercial work is growing according to plan, approximately 25 percent of our employees are engaged in commercial work, and we project that within three years, our non-Grumman business will exceed our corporate work."

Ecosystems . . .

Grumman Ecosystems President Bill Zarkowsky pointed out that this subsidiary is significantly different today than it was a year ago. "A year ago our primary income resulted from airborne ecological studies," he said. "Today, Ecosystems is a designer and builder of pollution control facilities, and is firmly entrenched in the fields of solid, air, and liquids waste treatment. This transition developed as a result of market studies which began nearly five years ago and have been made concurrent with improved focus in our environmental and mapping efforts."

He said that the firm's initial work has been in the design and construction of "turnkey" sewage plants for housing

developments, that is, those in which one firm is responsible for both engineering and construction. "This is a booming market on Long Island," Zarkowsky pointed out, "with a compound growth rate in excess of 25 percent a year."

He added that Ecosystems is bidding on municipal sewage plants, seeking licenses for industrial waste treatment technology, and is intensifying efforts in the control of solid and air pollution. While the environmental and mapping portion has "matured during the past year," he said that Ecosystems decided to sell its remote sensing aircraft and apply the funds toward other phases of the business. "We now plan to use subcontractors for our airborne data acquisition requirements," Zarkowsky said, and "we expect to continue to supervise the work to achieve the quality we demand."

International . . .

Grumman International's President Bob Townsend said the subsidiary's principal efforts were directed toward "our new aircraft programs, subcontracts with foreign aerospace companies, the overhaul and modification of the HU-16 Albatross, and our spares programs."

Sales and marketing efforts continue around the world, he said, with countries such as Chile, Peru, Mexico, and a number of African nations. "Our military programs continued to be the primary interest during 1972," he said. "Potential E-2 sales to Japan and the Kingdom received our highest priority effort."

On the organization changes within International, Townsend said: "We have made a number of organization changes to expand our commercial operations, we have altered our operating philosophy to become self-supporting, and we have established new

(Continued on page 8)



Photos by Fred Annette

Ten high school seniors named for Grumman scholarships . . .

The first Grumman Engineering Scholarships were awarded to graduating seniors of June 1944. Twenty-nine years later — and 299 scholarships later — the Company announces the ten newest winners from the class of 1973.

Grumman has been offering these scholarship awards "to encourage talented and ambitious graduates of Long Island schools to study engineering." The winners receive four years at an accredited engineering college of his or her choice with the Company paying the tuition and laboratory fees. They also are provided summer jobs with the Company and employment with Grumman after college, provided a suitable position is available at that time.

Ten engineering scholarships have been awarded annually, with the exception of a three-year period from 1955-57 when 13 were awarded. Three of the grants are designated for dependents of Grumman employees who are named entirely on the basis of their standings in the College Entrance Examination Board tests (CEEB) taken in March. The other seven winners and the three alternates, are selected on the basis of their CEEB tests, academic and personal backgrounds and achievements.

'First' for dependents

This year marks the first time that dependents placed in the open competition have won two scholarships. They are John S. McCarthy, son of John McCarthy of Grumman American in Savannah, and Steve Wertheim, whose father is Max M. Wertheim of Power Generate and Conversion in Plant 35. Grumman dependents also won two alternate positions: John C. Pereira, son of John Pereira, of Grant Hedrick's staff, and Dorian Jung, son of Let W. Jung, electrical engineer in Plant 5.

The winning three dependents of Grumman employees are:

CAROL BURKHARDT, daughter of Phillip E. Burkhardt with Computer Equipment Design, Plant 15, who feels her strongest areas are in math and physical science. This National Merit semi-finalist plans to attend Cornell Engineering School and concentrate in applied mathematics. Carol is an honor student at Half Hollow Hills High School and participates in several intramural sports. She says that painting and drawing are her favorite pastimes. Her father comments: "To put it as conservatively as possible, I was very pleased and I'm sure Carol may prove to be a valuable asset to Grumman."

GARY L. WAAG, son of Bernard Waag, Drafting, Plant 1, plans to enroll at Rensselaer Polytechnic Institute in Troy, N.Y., to study computer science. Ranking third in his class of 420 students at Island Trees High School, Gary is a member of the National Honor Society. He has a keen interest in mathematics and science. He has been on the soccer team and is a member of the varsity club. Young Waag has also branched out to the musical world by joining the band, orchestra and jazz workshop.

KEITH GAYLO, son of Benedict J. Gaylo Jr., an Electronic Project Engineer, Plant 25, has a variety of interests and accomplishments. This Syosset High School senior has done radio-controlled model aircraft work, and is accomplished in skiing, cinematography, metal working and archery. Working with his brother, he has gone into classic car restoration, in addition to being a member of the Police Boy's Club rifle team. In September, Keith will enter Rensselaer Polytechnic Institute to study mechanical engineering.

Seven winners from the Open competition are:

JOHN E. RAGER, valedictorian of his class at

Mineola High School, has a long list of achievements. In addition to receiving the gold pin—highest award for a 'mathlete' at his school—he has written two books on solutions to math problems and has studied Einstein's equations on relativity.

John attended a seminar on biological research at Waldemar Institute and has taken several courses at Adelphi University. Young Rager is also involved in many extra-curricular activities including the Chess Club, Eagle Scouts, school newspaper, ten-



Grumman scholars. Winners of the 30th annual Grumman Engineering Scholarships are: (1) Keith Gaylo; (2) Michael Atlas; (3) John S. McCarthy; (4) Carol Burkhardt; (5) John C. Pereira (alternate); (6) William J. Mazzei; (7) Gary L. Waag; (8) Michael N. Gershowitz; (9) Steven W. Wertheim; (10) Paul A. Levitt; (11) Dorian Jung (alternate); (12) John E. Rager; and (13) Alan M. Gopin (alternate).

GRUMMAN, May 25, 1973

...earn full four-year tuition grants to engineering schools

nis team and teen-age Republicans, to list a few. John will study physics at Massachusetts Institute of Technology.

JOHN S. McCARTHY, son of John McCarthy, assistant material manager with Grumman American Aviation Corporation in Savannah, Ga., is interested in Short Take-off and Landing (STOL) aircraft, and has aspirations of becoming a pilot. Valedictorian of his class of Sol C. Johnson High School, John is also captain of the football team, parliamentarian in student government, and recipient of the Georgia Governor's Award. This fall, this well-rounded young man will head north to attend Princeton University and study aeronautics.

MICHAEL N. GERSHOWITZ of Massapequa High School has a wide range of interests in the technological field. He is a ham radio operator who has expanded his basement hobby workshop to the point where he is now self-employed as a repairman of TV, radio, hi-fi, stereo, tape recorders, etc. A member of the Civil Air Patrol, Mike has fixed that group's Link simulator. The Rensselaer Polytechnic Institute-bound student has also developed his skills in sheet metal work, pattern development, gas and electrical welding, forging procedures and heat treatment, not to mention being able to run milling machines, shapers and tool grinders. He plans to major in electrical engineering.

Strongly aerospace oriented, **PAUL A. LEVITT** has built U-control model airplanes, about 15 rockets and a Saturn-1B model that has taken a frog and camera aloft. He is a Civil Air Patrol deputy commander with over 30 hours in a C-172. Through his Explorer Post, Paul has worked in the X-ray department as a hospital volunteer. There he prepared patients and developed film. He is also an ambulance attendant, applying first aid on board. Many of his professors marvel at his initiative and am-

bition. Young Levitt forms his own clubs when none exists. And to add to his accomplishments, Paul has also undertaken several character roles in short plays. Come September, the Smithtown Central High School senior will also enter Rensselaer Polytechnic Institute as an aero-astronautics major.

STEVEN WERTHEIM, son of Max M. Wertheim with the Power Generate and Conversion department in Plant 35, has a keen interest in astrophysics and energy matters which he will pursue when he attends Brandeis University this fall. He heads the computer group at Huntington High School and has developed many programs including a lunar module (LM) landing simulation. Young Wertheim is very active in Jewish affairs, including support of the Russian Jews. Besides being broadly read and musical, Steve plans to work in the housepainting and sign-making business this summer.

With today's emphasis on pollution control, clean-power intrigues **WILLIAM J. MAZZEI JR.** who has already worked with solar cells. He also takes an interest in car models and keeps physically active with weight lifting and karate. His principal says "Bill's charm, humor and tact makes him a very popular and effective leader." His activities included student organization fighting the drug problem, and the Hicksville High School representative in Albany when students "ran" the government for a day. Young Mazzei, who was second in a class of 1,046, won a National Science Foundation award to attend a course at a college in Potsdam, N. Y. Before Bill entered High School, he set his goals toward obtaining an engineering degree from Massachusetts Institute of Technology, and he is straight-on-course since accepted at MIT.

A strong electrical engineering talent, **MICHAEL ATLAS** has built Heath kit radio controls for his model planes which now number about 10. In ad-

dition, he built a model Wankel airplane engine. Valedictorian of his class at Seaford High School, Mike is co-editor of the school's newspaper, treasurer of the Nassau Environmental Council, captain of his math team, and plays varsity tennis. Photography is another one of Mike's activities. He will attend Massachusetts Institute of Technology to study electrical engineering.

Should a full scholar change his plans or no longer qualify for his Grumman Engineering Scholarship, the "alternates" step into the vacancy. The alternates are:

JOHN C. PEREIRA, a senior at St. Anthony High School, will attend Drexel University in the fall to major in electrical engineering and computers; **ALAN M. GOPIN** will be graduating from New Hyde Park Memorial High School in June and plans to attend Massachusetts Institute of Technology to study aeronautics; and **DORIAN JUNG**, a senior at Brentwood High School, will enroll in New York Institute of Technology to concentrate in civil engineering.

Selection committee

Members of the Grumman Scholarship Committee are Roy Grumman, Honorary Chairman of the Board of Grumman Corporation; Clint Towl, Chairman of the Board; Bill Schwendler, Chairman of the Executive Committee; and Dr. Ellis L. Phillips, Jr., President of Ithaca College.

The Scholarship Recommendation Committee is made up of Larry Mead, Vice President and director of Technical Operations, chairman; Tom Kelly, Vice President and director of Space Programs; Art Gilmore, director of Training & Development; Dick Cyphers, section head, Structural Systems; Dick Imgram, Systems Technology staff; Pete Van Putten, personnel director of Grumman Data Systems; and Art August, director of Advanced Development.

**At Grumman,
getting together
is a 'family affair'**

When a group of Grummanites get together far from home, it doesn't take long for them to come up with a "family picnic." That's been true on Long Island for years and years, and at Stuart, Fla., Savannah, Ga., Houston, Tex., and just about any place else where Grumman has established a facility.

So it wasn't unexpected when the accompanying photo of Grumman's

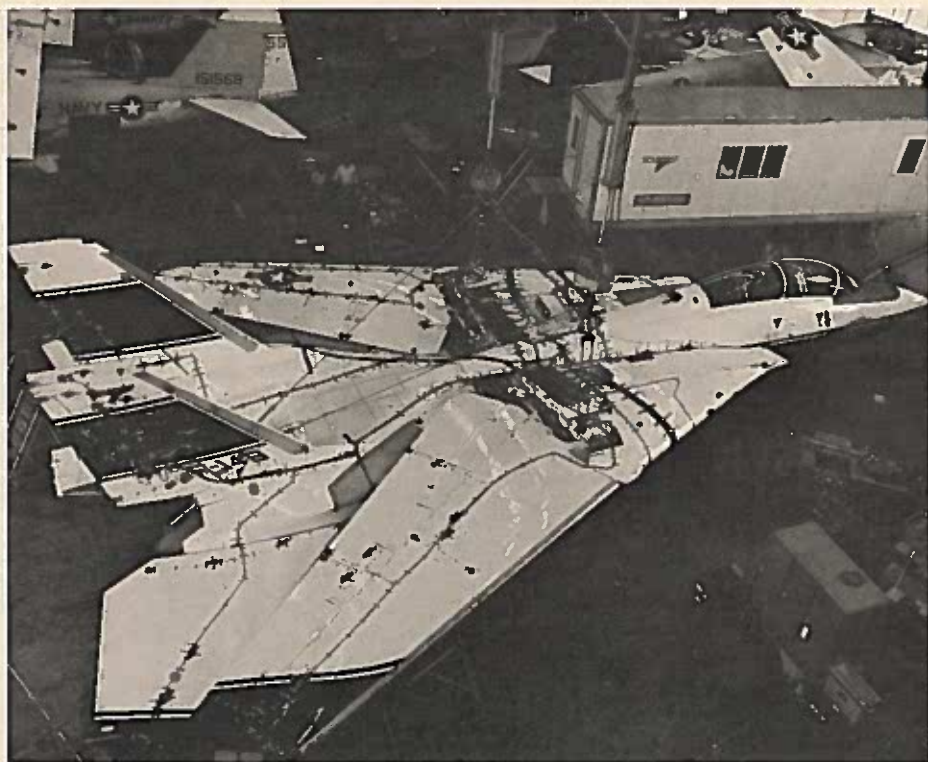
latest expeditionary force—the engineering group assigned to Rockwell International's Downey Aerospace facility—arrived at Bethpage last week.

These families from Grumman Aerospace held their picnic on the last day of March at Doheny State Beach, San Juan Capistrano, in California. Represented in the group were members of the structural sys-

tems, stress, and mechanical systems areas in Product Engineering.

Entertainment—besides food, of course—included swimming, baseball, egg throwing contests, and sack races. And to cap off the day, Grumman engineers, aided by their many fine English and Irish members, defeated a visiting Mexican soccer team before a "hometown" crowd.





Time saver. The Company's unique new mobile Ground Vibration Systems van possesses two highly valuable features: an ability to cut test time (and money) and to drive it to the test scene.

Many areas of activity . . .

Past, present, and future products and ventures were on view in an almost wall-to-wall exhibit of hardware, photos, models, and sound films in this year's annual Grumman Shareholders' meeting.

And outside, on the north side of Plant 4's hangar 3, were examples of the Company's diverse product line—such products as Gulfstream II, the P-30 Pearson yacht, the 21-foot Motorhome, the Grumman Rescue Master, three structural sections of the F-14 (wing center section, horizontal stabilizer, and wing), and the Mobil-health Detection Office.

In terms of crowd response — a difficult factor to measure — the F-14 and the Health System display seemed to run neck and neck, with a Lunar

Module exhibit coming in a close third. But of course, the idea was not to judge the "quality" of exhibits in a competition. Nor could that be done fairly even if one wanted to; for the object was different: to show each attending stockholder, at a glance, the many, many sides of Company activity. And as one shareholder said, "We're into a hell of a lot of things."

By far the largest single area of effort is aircraft. Scale models of the A-6A (the world's first all-weather attack aircraft) and its derivatives — A-6C, A-6E, A-6E TRAM (Target Recognition Attack Multisensor), EA-6B electronic countermeasures, and KA-6D tanker— were there, with accompanying words and photos.

Almost directly across the hangar was a magnificent Health Systems display highlighted by an actual Grumman Operating Room Console. Nothing in the exhibit was "way out, futuristic," for the hardware and systems were there. It was futuristic only in the sense that these Grumman-developed health systems stood at the doorway of large-scale use.

And there was so much more to see about other Grumman thrusts into the future. Exhibits featured such topics as leisure-time product lines from canoes and sailboats to Olson Bodies and motorhomes, flight test services and surface systems to materials and processes and cost reduction. Ecosystems suggested solutions to environmental problems, Grumman Data Systems told of its progress, as did Grumman International. All in all, it was the stuff of progress based on demonstrated achievement.

Mobile system-van providing speed up to vibration testing

"The Company now has the best Ground Vibration Survey (GVS) capability in the country," says Will Pettit, manager of Ground Test Instrumentation, Flight Acceptance Department.

"Because we have integrated all the hardware elements required for test into a single mobile, flexible system-van we can respond more quickly to test requirements," Pettit says. "And we have added a capability to the Company's inventory which has the potential of being leased to other aerospace companies and agencies."

The real key—the reason why the van is needed—is to compress ground test time so that more time is allowed to flight tests. When the first aircraft of a series comes off the line, or when flight structural anomalies occur during development of an aircraft, vibration test must be performed to discover whether damaging vibration (or "flutter") will happen in flight. This information also "backs up" the structural analysis. While vital to an understanding of the aircraft and its flight behavior, however, these ground tests can delay the flight test program, and must be accomplished as accurately, quickly, and economically as possible.

In other words, ground time on a flight-test aircraft can be considered as "lost" time. The need is to fly.

"The old way of doing a GVS was tedious and time-consuming," says Gene Martone of Mechanical Environmental Test. "The plane was hanging there (as it still does) and a man moved transducers from point to point. It took an hour and a half to measure an overall model response that way. And when you realize that over 200 vibration modes had to be investigated on F-14 No. 1 before it could fly, you can appreciate the ground test time required. It would have taken 45 days to perform this task."

Computer controlled

"But we cut that time to 5½ days by using very light (1.2 ounce) fixed transducers that don't effect modal response, eight vibration shakers with central control, and by using a computer system that gets data from up to 300 transducers in almost real time, and a magnetic tape for off-line processing by GDS."

But something even better was needed. While the time to perform the tests had been drastically reduced, preparation time was still a critical concern, with the logistics of moving the required equipment taking longer, in some cases, than the test itself. So the functional organizations involved, FAD and Engineering Test & Operations, worked together to solve this problem. And the solution was found this year after "stuffing" \$350,000 of equipment into a mobile van that can be taken

over just about anywhere to do the GVS job.

This \$60,000 van is an integrated-systems vehicle that for the first time drastically cuts down the "get ready" part of the job (as contrasted with the "test time" job). Pete Anderson of Ground Test Instrumentation (FAD) and Martone of Mechanical/Environmental Test (Engineering) worked together to define the van's requirements. Jim Minicozzi of Instrumentation Systems Design was responsible for procurement and integration, and Jack Walton of Facilities Engineering took care of power, air conditioning, and lighting. Facilities equipment was installed by Joe Congero's Prototype Shop in Plant 33 (now in Plant 5), and Ray Waters' Instrumentation technicians in Plant 5 installed the systems equipment.

"The first use of the van resulted in a 10-to-one reduction in manpower expenditures for logistics," says Pettit. "And further, we are finding uses for the van in other areas of ground test, such as support of the F-14 mechanical and hydraulic simulator in Plant 14. The potential appears unlimited."

CALENDAR of events

Notice of events for period June 8 to June 25 should reach PLANE NEWS by June 10.

Amateur Radio Club: Wed., June 20, WA2LQO radio shack on Pit. 5, Roof local, field day planning, open to outsiders. E. Goodman, Ext. 87125.

Chess Club: Tuesdays, 5:30 p.m., Pit. 30 cafeteria, open to outsiders. Alex Ikonnikow, Ext. 1251.

Coin Club: Every Wed., 12:05, Pit. 25 vendor conf. rooms. Informal lunchtime meet. Ken Hale, Ext. 1936.

Duplicate Bridge Club: Every Thurs., 6:00 p.m., Pit. 30 cafe., CWB franchised with ACBL, duplicate bridge game, outsiders welcome. D. Pan-shoukian, Ext. 2798/87280.

Ex-Service Men's Club: Wed., June 6, 7:30 p.m., Pit. 28 auditorium reg. month. meet., veterans (employees). Al Kordula, Ext. 87259.

GAC Divers Club: Wed., June 6, 5 p.m., Plant 15 Buffeteria, membership drive, elections, dive schedule, and contest plans, for info, call J. Roth, Ext. 86411.

Stamp Club: (Bethpage), First, third Wed. of month, 5 p.m., Pit. 30 cafe., circuit book sales, swap, auction, discussion, new members, guests, fledgling philatelists. Elliott Manaker, Ext. 2324.

Table Tennis Club: Every Thurs., 7:00 p.m., Pit. 24, Wed., June 6, club challenging Huntington, T.T.C. Ted Wakulinski, Ext. 7382.

Family Campers: Camp-out, May 25-28, Mountandale, New York; June 8-10, Rhinebeck, New York. Herman Heinlein, Ext. 9518.

Flying Club: Fri., June 8, Pit. 28, business meet., & FAA film, guests welcome; basic training session, Tues., May 29. Betty Schledorm, Ext. 86827/7372.

Society of Manufacturing Engineers: Mon., June 11 5:30 p.m. cocktails, 6:30 dinner, 7:30 speaker, Pickwick Motor Inn, Plainview, Exit 48 IJE, Occupational Safety & Health Act, Mr. R. Jordan, Compliance Officer & Ass't. to area director of Labor O.S.H.A., guests welcome. C. Frank, Ext. 3520.

On shareholders . . .

(Continued from page 5)

priorities for the conduct of international business."

In addition, Grumman International is engaging in several joint ventures, one of which is the recently completed agreement with Fokker of Holland to form Grumman Avio Systems Corp. to produce and sell airport passenger loading bridges. Plans are well advanced for another joint venture for the production of Pearson Yachts in Europe, he said, and "in close cooperation with Grumman Aerospace and Grumman American, we are pursuing a joint venture with Embraer, the leading aircraft company in Brazil, for the design and production of a 30-passenger Brazilian-built turboprop commuter aircraft derived from our Grumman Gulfstream I."



Pistol champ. Al Berka (R) of Security is congratulated by Vice President Tom Rozzi for his winning effort at the mid-winter national pistol matches that attracted 250 competitors at Tampa, Fla., earlier this year. Berka placed first in 'police master' and scored 2560 out of a possible 2700 with .22, .38., and .45 caliber weapons. Among his prizes was a Smith & Wesson .22 target pistol.

Fun-in-the-sun trips to Barbados and Martinique offered by GAA

The Grumman Athletic Association plans two exotic fun-in-the-sun trips for June: Barbados, West Indies, and Martinique, French West Caribbean. Interested in either?

If your choice is Barbados, GAA has arranged a flight aboard British West Indies Airways (BWIA) with accommodations at the Miramar Beach Hotel from Friday to Friday, November 16 - 23.

A fare of \$342 per person based on double occupancy, includes ocean-front rooms, two meals daily, membership in Miramar Rum Club, free tennis and shuffleboard, golf nearby, choice of island tour or \$5 gift certificate to be used at Boutique Miramar, transfers between hotel and airport, gratuities Modified American Plan (MAP) portion, sunset cocktail cruise, and departure taxes.

Reservations for the trip will be accepted Wednesday, June 13, at 5:30 p.m. in Plant 28 waiting room.

The Martinique trip goes from Saturday to Saturday, November 17-29, travel by Air France with accommodations at the Bakoua Beach Hotel.

The \$377 fee (based on APEX Air Fare, subject to Government approval), includes full American breakfast and dinner with wine, transfers between airport and Bakoua, waterfront

air-conditioned rooms with balcony, free use of sailing boat or pedalo, free use of tennis courts during the day, discount on water ski activities, steel band three nights a week, and shopping tour of Fort-de-France.

Sign up date for the Martinique trip is scheduled for Wednesday, June 20, 5:30 p.m. in the waiting room, Plant 28. Full payment of the fare is required at scheduled reservation dates for both trips. Checks should be made out to Bethpage Aircraft Tour Club. For additional information, call GAA, Plant 30, Ext. 2133.

Gophers notch perfect records

It's getting to be a habit—almost a certainty, you might say.

That situation developed when the Grumman Gophers rifle team wound up with another undefeated season in the L.I. Industrial League with a record of 10 wins and no defeats. And the wins were racked up with such regularity that no one even thought to mention it until victory No. 9—a 772-753 decision over Sperry—was recorded. Bob Mansbart's 196, George Hilton's 195, and Womble's 194 were outstanding for Grumman.

The final match, win No. 10, was a big one, a 778-713 triumph over Republic. Leading the Gophers were Womble, 198, Paul Waisanen, 195, Hilton, 193, and Mansbart, 192.

The Gophers, as a team and individually, will be firing in a number of tournaments coming up, among them the National Industrial Postal Matches. In that event, teams from around the country fire at a set of targets and send their scores to the National Rifle Association. The Gophers are past champions in team and individual competition in the nationals.

The Grumman Gophers rifle team will hold its annual meeting and membership drive on June 13 at Plant 28 between 5 and 7 p.m. The meeting is open to all Grummanites. You don't have to have previous rifle marksmanship to enroll; training equipment will be available at the Island Trees High School rifle range in the fall. For further information, call Warren Block, Ext. 2897.

Pinehurst on tap

GAA has scheduled three mixed Pinehursts this season, with the first scheduled for Wednesday, June 20, and the other two on July 18 and August 22. Tee-off time has been set for 4:30 p.m. on the Yellow course at Bethpage. Greens fees are \$5 apiece; sign-up must be made at the GAA office in Plant 30.

Diehard keglers finally finish long season

What season outlasts hockey, basketball, and football? The Grumman bowling league season, that's what. Diehard league bowlers have been staring down the alleys at the 10-pins for over 33 weeks. And now the marathon is just about over.

Seven leagues closed out the long season this past week. In the Patchogue Mixed league, the Captain and his Crew team finished in first place. The victors had high season game team of 764; and Joan Burgess was the women's seasonal high series bowler with 583. Ken Becker also was a big boost to the winners with men's high season series of 684. Gene Burgess followed through with fine support in the last game with 200. Ed Campbell of the Jejo's had high game for the season for the men with 256.

Top keglers in the Trader league were a team called the Knights. Captain Charlie Howard was awarded the second high series for the season. Season high average went to the Crusher's Frank Nelson with 184; and C. Gilmore of the Kings was the most improved bowler. High game honors went to George Slavik of the Gales.

In the Blue Mixed league, the All-Togethers came out on top again while also racking up the high team series of

766. Bill Brennan had high game in the league with 259, while Vin Tafuro captured high series with 238-624.

The Pineapples of the Syosset Mixed league are number one. Rita Mathia was top women's season bowler with a game of 234, while Monica Wojtyniak had high women's series of 584. John Betterino was the high men's bowler of the season with 279-671.

Joe Gallo of the Jesters in the Aerospace league was high average keglers for the season with 181, but his team had to settle on second place. The 4-Guys grabbed first place honors, while also capturing the high season team series with 2,228. Fred Schaeffler was high game winner with 252.

Mellinger hits 638

Final standings in the Gray league found the Spoilers on the top, thanks to fine season performance of Mark Mellinger. Mark pushed them to the top with a final showing of 245-210-638.

The Mapledusters were crowned victors in the Century Mixed league. Nancy Gentzlinger was high women's bowler with high game and season series, 244-595, while Bill Gentzlinger was high men's bowler with 242.

The Sports edged the 4 Kings to grab

first place honors in the Black league. Bill Voigt of the Aces had high series with 668, and Ted DiJa of the 4-Kings had the top game of the season, 279.

The Masters league still has one week left to break a few more records. The Webs are still holding onto the lead with the Demons breathing down their necks. Dick Spalding's 60-855 and Phil Piacentini's 256 are keeping the Demons alive.

Rice top gun

When the cease-fire was declared, the Grumman center fire team found themselves 66 points behind the L.I. Gunners Club, 1014 to 1080. Dave Rice was up to his normal self, shooting 278; Greg Criscione chipped in with 260; and Ron Trenkner and John Crawford contributed 239 and 237, respectively. The Grumman team finished the season in the South Shore league at 7-7.

The Rod and Gun Club recently announced the high center-fire average shooters: Dave Rice, 1st master with an average of 272; John Crawford, 1st expert, 227; Phil Boehm, 1st sharpshooter, 255; and Ron Trenkner, 1st marksman, 242.

For Rent

APT: 3½ room, central a/c, pvt. entrance. no children or pets, \$225/mo. 364-2631.

ROOM: Massapequa Park, sep. ent. LI 1-5602.

MOTOR HOME: Sleeps 6-8, Winnebago, fully self-contained, a/c, p/s, reasonable. 724-2434.

ROOM: One mi. from Grumman, kit. privileges, \$25 week. PY 6-4210.

CONDOMINIUM: Or for sale, 2 bdrm., lvg. rm., kit., fully carpeted, new appl., pvt. swimming pool, immediate occupancy. 731-3083.

APT.: First floor of home, So. Farmingdale, 2 bdrm., dng. rm., kit., lvg. rm., gar., \$295 incl. utilities. Available immediately. Julio, Ext. 84827.

ROOM: Deer Park Village, after 6 p.m. 261-3234.

TENT TRAILER: Coleman hdtop, sleeps 6, includes all accessories, \$11/day. 751-1256.

APARTMENT: N. Massapequa, 7 rooms, 3 bedrms., carpet., a/c, dishwash., all utilities, \$325/mo. MY 4-7587 after 6 p.m.

Car Pool

RIVERHEAD: To PIT. 15 area, day shift. 727-6347, evgs.

For Sale

BOAT: '65 runabout, 15 ft., fbgls., fully equip., 40 hp Johnson, '71 trail., \$750. 676-7257.

BOAT: '63 Owens Sportfisherman, 28 ft., fly. bridge, head, galley, dual sta., ship-to-shore radio, depth finder, 185 hp Flagship eng. summer and winter cover, ready for water, \$2,800. 582-3826.

SAILBOAT: 22 square meter-keel, cuddy cabin, head, teak deck, fully equip., \$1,800. 433-6497. evgs.

CAMPER: '69 Apache Ramada, pop-top, sleeps 8, canvas sides, stove, sink, icebox, dinnete, spare, extras. R. Frampton, Ext. 3838.

DEHUMIDIFIER: Auto., less than 3 yrs. old. 543-2423.

KITCHEN SET: Gray & crome table with ext. leaf, 4 padded chairs, \$30. JU 1-3125.

BEDRM SET: Mediterranean, triple dresser, lamps inc., cost \$1000 sell for \$475. PE 5-9142.

KITCHEN UNIT: 8 ft. Birchwood, sink, 20 in. elec. stove, range hood, six mo. old, \$450. 669-8590.

BEDS: Dark pine finish bunks, bunkie mattress sets, purchased last August, \$200. 277-9449.

POOL: Muskin, 3 ft. x 12 ft. round, 15 gauge liner, HPE filter Mod. 7200, pool vacuum, \$50. MY 1-5948.

LAWN MOWER: Sit-down, Lawn Master, Briggs/Stratton, gas eng., 3 fwd. spd., 1 reverse, \$69. 368-9098.

BABY CARRIAGE: Coach port. crib for \$50. 864-3092.

TABLE: Dining room, walnut extension, two leaves, \$125; kidney-shape vanity table, mirror fitted skirt, \$20. 864-3092.

MISC.: Sears auto tape deck, \$50 ask. \$35; Borg Warner Tio four spd. for B16 block ford with Hurst linkage, \$75. 724-5682.

GARAGE DOORS: Two, wood, overhead, paneled 7 ft. x 8 ft. hardware inclu. 744-6653.

SAILFISH: Alcott, 14 ft. fbgls, all equip., \$225. 722-3934.

LAWN MOWER: Craftsman, self-propelled, reel 3.0 hp eng., grass catcher, \$70. 669-7243.

BARBECUE: Weber 18 in. kettle, avocado porcelain, weatherproof cover, 22. 266-6739.

GOLF CLUBS: and bag, starter set 1, 2, 3. wood and 2, 4, 5, 7, 8, 9, and putter irons, \$20. 781-3692.

BEDRM SET: Solid mahog., dresser, vanity, night stand and single size bed, \$50. After 7 p.m. 781-3692.

TRAILER HITCH: And inside side tire mount for Ford Bronco, \$15 for both. BA 3-1214.

MISC.: 2 ranch type alum. windows, 1 picture window, one 30-in. jalousie storm door, 30-in. elec. wall oven, very reasonable. 368-7169.

CAMERAS: 2 Polaroid, takes b/w pictures, flash attachment, \$10 ea. 588-3951.

WASHER: Sears Model 400, white with all hook-hoses, \$45. 698-1621.

TORO MOWER: 25 in. reel, snow blower, power handle, \$95. 549-5613.

CAP: For pick up truck, 8 ft. bed, \$175. JU 1-4817.

HOUSE: Farmingdale, 3 bedrm. ranch, 2 bath, fin. basemt. w/wet bar, 4 appl., cov. patio attach. gar., w/w, s/s, fenced-in-yard, principals only, \$42,900. CH 9-9183.

For Sale

CAMPSTOVE: Primus propane, two burner nickel plate top, used twice, \$20. MY 4-2327.

LAWN MOWER: 20 in. reel, self-propelled, 3.5 hp B&S engine. 921-1549.

MISC.: Wheelchair, E & J Hollywood model, complete with foot & leg rests, chair-high metal table & lambs wool, bed-size mat. inclu. \$125; Canadian crutch, adjust, \$10. 249-0856.

MISC.: Myers ¾ hp water pump, \$45; Atlas baby carriage, \$10; manual reel mower, \$10. 757-0438.

RENAULT RIO: '68 4 spd., radio, Michelins, 35 mpg, carefully maintained, ask. \$425. 928-0967.

PIANO: Cable console, walnut finish, contemp. styling w/bench, \$550. Evgs. 692-2738.

MAGAZINES: Aero Digest. 1944 thru 1949, \$30. 249-5740.

STORMS - SCREENS: Set 12 wood, plate glass picture window, call for sizes and price. PY 6-1139.

INTERCOMS: Lafayette, wireless, 2 station, \$25. WE 8-7501.

DINING ROOM SET: Solid Oak, modern table, 40 x 60 in., ext. & pads, sliding glass china door, 52 in. long, 4 chairs, 1 capt. chair, upholstered seats, wood contour back, \$250. Ext. 1198.

BOAT: 25 ft. Sport Fisherman, all fbgls., flybridge, twin 150 hp stern drive, galley, dinette, used 65 hrs. 864-4900.

OUTBD. ENGINE: '68 Bearcat, 4 cycles, needs some repair, best offer over \$50. 473-5980 or 549-5493.

BOAT: 21 ft. Flying Finn, 100 hp Evinrude, misc. equip., 30 gal. fbgls. gas tank, Lovett bilge pump, \$550. 941-9356.

BOAT: 19 ft. Grady White outbd. runabout, 85 hp Mercury elec. start, Sealion trailer, wood lapstrake hull, full canvas, bilge pump, \$900. (212) FI 7-6105.

TRAILER: 19½ ft., "Four Seasons", '72 self-contained, four burner stove, refrig., thermostat, batt. pack, elec. lighting, shower, dble. axle, sleeps six, hot water heat, \$3300. 842-4103.

BOAT: 8 ft. water scooter, ideal for small lake, \$75. 921-1549.

TRAVEL TRAILER: 16 ft. Shasta, stove, oven, heat, sleeps 6, \$1200. AT 1-8015.

BOAT: Islander '67, 22 ft. fbgls, deep V hull, 150 hp, inbd/out drive, fresh water cooled, new batt., power tilt motor, manifolds, canvas top, extras, ask. \$3300. Evgs. MO 9-5981.

BOAT: '72 Cobra, 17 ft., 50 hp Johnson, elec. start, cox trailer, \$2380. 261-5048.

BOAT: '69 Seasprite, all fbgls., 15 ft., with '69 Mercury outbd. and controls, fold down bucket seats, canopy, windshield, batt., anchor, \$795; trailer, '71 Sterling, 15-18 ft., \$125. MY 4-2805.

BOAT: Boston whaler, 17 ft., bow rails, suntop, 75 hp Johnson motor, elec. starter, fuel tank, \$1700. 921-1549.

BOAT: Aerocraft 16 ft. fbgls, Johnson 50 hp motor, elec. start, two years old. 298-8037.

SAIL BOAT: Penguin, fbgls, fully equip., \$385. 744-3285.

HOUSE: Babylon Village, 50 year old col., 3 bdrm., 2 baths, 9 mi. to Bethpage, large plot., \$39,000. Evgs. 587-5279.

PROPERTY: ½ acre, South Country Rd., East Patchogue, near water, golf course, \$12,500. 588-4759.

LAND: 1 1/8 acre, Pocono Pa., pvt. comm, reasonable. After 6 p.m. 796-2057.

HOUSE: So. Farmingdale, custom split level, 3 bdrm, 2½ baths, cul de sac, oversized plot, new broadloom w/w appl., fireplace, fin. den. fenced, patio, \$51,500. 249-2703.

LADDER: 24 ft. wooden ext., \$25. PR 5-1941.

For Sale

HOUSE: Sayville, 4 bdrm., col. lvg. rm., dng. rm., den, eat-in-kit, 1½ baths, w/w, 1/3 acre, \$40,990. 567-0543.

HOUSE: Selden, 3 bdrm, 1½ baths, pan. den, appl., ½ bsmt., fenced, w/w carpet, maint-free, extras, \$29,500. After 6 p.m. 732-5954.

HOUSE: Brentwood East, cape cod, 4 bdrm. dng. area, eat-in-kit, self-clean oven, all appl., s/s, w/w carpet, part. fin. bsmt., fenced property, \$28,700. 231-6836.

IMPALA: Station wagon, '65, new brakes, \$400. TU 8-0189.

CHEVELLE: '69, 4 dr. auto trans., r/h, orig. owner, blue, \$1050. 681-8466.

OLDS: '69, "98", conv., all power, air, cruise, tape deck am/rm, new Monroe 500's, Delco eng., brakes, snow tires, 455 cu. in., 42,000 mi., saddle leather seats, \$2000. JU 7-2357.

FORD: '68 LTD wagon, new tires, 47,000 mi., ask. \$1400. Between 4-8 p.m. 676-6405.

RIVIERA: '71, a/c, all power, bucket seats, tilt wheel, stereo tape deck, \$3750. 621-0920.

HONDA: '72, SL-175 CC, new motor and trans., 700 mi., \$550. MA 3-2081.

PLYMOUTH: '71 Cricket, auto trans., 5 radial tires, 2 radial snows, radio, disc brakes, 21-25 mpg, extras. 864-5942.

BUICK: '70 LeSabre custom, 4 dr. hd top., all power, a/c. 543-4197.

HONDA: '73, (500), new with warranty. MO 9-2896 or 666-0370.

CHEV.: Impala, '63, 4 dr., 6 cyl., auto trans. Ask. \$275. 796-7657.

CHEV.: Impala, '62, 4 dr., radio/heater, V-8, auto, power steer., \$150. 277-3513.

OLDS: '65 Jetstar 88, V-8, all power, auto trans., 39,000 miles, 4 dr. sedan. Ask. \$595. 334-8942.

SAAB: '68 deluxe, 2 dr. sedan, model 96V-4, front wheel drive, mounted snows, radio, 40,700 miles, ask. \$995. MO 1-5145.

PLYMOUTH: '70 Fury I, 4 dr. sedan, all power, elec. windows and trunk release, vinyl roof, 49,000 miles, \$1,295. JU 7-3525.

CLUB CHAIRS: (2) upholst., gold, 2 sets slip covers, \$50 ea. After 5 p.m. 433-3745.

MOTORCYCLE: Harley Davidson sportster, '70, ask. \$2300. Evgs. 293-3093.

BOAT: 14 ft. Lyman, '68 Sealine trailer, 12 h.p. outbd., \$300. MO 1-6272.

MOBILE HOME: '69 Liberty, 60 ft. x 12 ft., 2 bedrms., kit., bath, o.h.w., central a/c, \$6800. After 5 p.m. 585-1967.

BOAT: '70 fbgls. Cobia, 15 ft. tri-hull navy top, walk through, 40 h.p. Johnson, Homer trailer, \$1600. (212) 428-7003.

BOAT: 17 ft. Crestliner, fbgls., Johnson 75 h.p., Holsclaw tilt up trailer, xtras, \$1000. Call anytime. (212) 325-6578.

MOBILE HOME: 17 ft. Holiday Rambler, self-contained, sleeps 6, \$1,200. JU 1-1707.

STEREO CONSOLE: Admiral, 2 Lafayette 8 in. woofers, two 2 in. tweeters, am/fm/fm stereo, tape input, cabinet, \$150. 938-7359.

FREEZER: 18 cu. ft. United. upright, white, \$200. 234-6074.

ORGAN: Acetone rock, four octaves, five stops, vibrato, carry case, \$80. 785-6576.

GOLF CLUBS: Spalding Top Flite woods (3), MacGregor Tommy Armour irons (9), \$75. FO 8-4340.

FREEZER: 18 cu. ft. United Harves Queen, commercial, \$195. 928-1043.

RECORD CHANGER: Garrard stereo auto., 4 spd., \$18. 928-1043.

For Sale

DINING SET: Ethan Allen antique pine, 48 in. round, ext. table w/ two 12 in. leaves, four captain chairs, \$300. MY 4-6737.

MISC.: Baby carriage, blue, \$60; Built-rite English coach w/mattress & shopping basket; playpen, nylon mesh, \$10; Port-o-crib w/ hi-chair, \$10. 352-2868.

MISC.: Primus two burner port. stove, \$28; Garrard model 210 turn table, \$20; one pair VW bumpers. fit '68-71, \$15. LT 9-5019.

MISC. EQUIP.: Massey Ferguson ride-on tractor. 8 hp eng., 42 in. rotary mower, ask. \$425; Howard Gem rotatiller, one cyl., English eng., 20 in. cut, ask. \$550. After 5 p.m. GE 3-6684.

GOWNS: Three bridesmaids, blue dotted Swiss, picture hats, \$25 ea. 864-6434.

MISC.: Two 40 in. Mediterranean lamps, white shade, blk. wrought iron, \$10 ea; two chairs w/ slipcovers, \$25 ea.; crib & chest set, walnut & white, \$20 both. FO 8-1155.

MISC.: Chest of drawers, \$45; drapes, dble. width, \$30; cyl. slide rule, English, \$20; col. maple end table, \$15; Sears Kenmore washer, 2 speed motor, timer, \$10; redwood, 2 in. thick table, 2 benches 6 ft., \$35; G.E. 18 cu. ft. freezer, \$200; Norge frig. 10 cu. ft., \$75. Evgs. 921-3192.

BABY ITEMS: Stroll-o-chair carriage, high chair, etc. After 5 p.m. 589-7107.

HAND MOWER: '72 Craftsman Sears, 18 in. reel, grass catcher, outside adjustment knob, \$30. Evgs. AT 9-9885.

VIOLINS: Two German, ¾ size, Kori Hofner, \$40; full-size Framus, \$60. 864-2891.

MISC. FURN.: Spanish 9-piece, king-size bdrm. set, fruitwood, \$850; Magnavox Astro-Sonic console stereo, 70-in., fruitwood cab., Mediterranean style, \$20; Spanish Admiral clor T.V., dbe. speak., 23 in. screen, \$375. 277-0919.

PHOTO EQUIP.: Speed Graphic, Graab timer, solar enlarger (5 ft. x 7 ft., Weston exposure meter, \$150. After 6 p.m. PY 8-9569.

OVEN: Hotpoint wall, elec., \$25; wood storm door/screen, \$10. AN 5-8461.

MISC. FURN.: One barrel-back tapestry chair, \$25; one drum tabe, \$15. 931-5229.

DRUMS: Perfect for beginn., 20 in. toss, 2 mounted tom-toms, 16 in. x 16 in. floor tom, snare, high hat, 2 cymbals, stand, \$100. After 6 p.m. 543-3760.

BIKE: Girls 3-speed Stingray, sissy bar, \$25. AN 5-6474.

BIKE: AMF boy's 24-in., never used, Sears girl's 20-in. HR 3-4477.

BIKE: Hi rise handlebar, 20 in. tires, basket, \$25; girl's 26 in. tires, \$10. CH 9-2665.

TIRES-WHEELS: Snows, two (2) G-78-15 w/w, two (2) 15 in. wheels. After 7 p.m. MY 4-4126.

MISC.: Patio table & umbrella, \$20; folding outdoor lounge, \$10; 32-in. round mirror, \$15; sewing machine chair, top raise for storage, leather top, \$10; Scott Spreader w/markers, \$12; misc. lamps and pictures. 473-0889.

DNG. RM. SET: 4 pieces walnut, formica top, modern, ask. \$90. 666-4524.

MISC.: Four Virtue chrome padded kit. swivel chairs, \$20; RCA 19 in. b/w port. T.V., \$30; Emerson 19 in. port. b/w T.V., \$30; child's 16 in. red tricycle, \$15; chrome 8-light hanging kit. fixture, \$20. 928-2743.

GAS RANGE: 36 in., w/heavy chr. tp. and griddle; refrig., 10 cu. ft., \$50/both. 488-3767.

MISC.: (2) dbl. beds, boxsprings, frames, headboards, \$25 ea.; maple single bed, compl., \$10; bureau, 10-drawer pins, \$15; bureau, 7-drawer contemp., \$12. 864-1436.

POOL FILTER: Filter Flo, for 18 ft. pool, vacuum w/hoses, \$25. WE 8-8924 after 6 p.m.

PIANO: Upright, \$100. PY 8-7207.

TRAVEL TRAILER: '72 Trotwood Landcruiser, 21 ft., tandem wheel, extras, \$3,200. 585-3414.

CAMPER: '60 Nimrod, sleeps 4, spare. 584-6391.

OLDS: '69 Ninety-eight luxury sedan, fully equip., all pwr., book value or best offer. 334-0134 afternoons or evgs.

THUNDERBIRD: '69, a/c, p/s, p/b, am/fm stereo, must sell, \$1,750. 587-5412.

BOAT: '62, 18 ft. blue fin lap, \$125. 588-2672 after 5:30 and wkends.

HOUSE: Levittown, full din. rm., w/panel, expanded lv. rm. w/beamed ceil., w/w, lg. kitch. w/bay window, 3 appl., 3-4 bedrms., w/storage area, s/s, \$37,990. 796-6414.

DIN. RM. SET: Mod. walnut tbl., w/ext./pads, 6 chrs., breakfront, \$200; bunk beds, maple early Amer., \$50. AN 6-2831.

GRUMMAN, May 25, 1973

For Sale

HULL: 27-ft. cruiser, unfinished but ready for eng., sheltered, \$650. IV 1-1947.

CORTINA WAGON: '68 Ford sta. wagon, GT1600 delux. 45,000 orig. miles, nds. eng., best offer. 271-4486.

SAILBOAT: 17 ft. fiberglass daysailer, alum. spars, dacron sails, w/trail., ask. \$850. 543-1913.

IMPALA: '67 Chevy, 4 dr. hdtp., a/c, p/s, w/w, all vinyl int., \$695; walnut crib, matt., used 6 mos., \$40. 826-6539.

MUSTANG: '65, 289 cu. eng., std shift, \$300. 249-2044

STA. WAGON: '66 Buick, V-8 sportwagon, p/s, orig. owner, ex. cond., snows, r/h, auto. trans. 751-2872.

WAGON: '66 Ford, 9 pass., country sedan., 289 v8 stand. trans., new clutch, \$600. JU 6-8287.

CONTINENTAL: '63, gold/bik. leather int., full power, under 69,000., \$350. W. Boyce, Ext. 82443.

FLOOR WAXER: Sears Kenmore, 2 spd., \$10. 938-6140.

VAN: '69 G.M., auto. trans., \$1,350. HA 7-6751.

IMPALA: '70 custom coupe, orig. owner, p/b, p/, am/fm, vinyl roof, rr. windw defroster, clock, 2 snows. \$1,650. 221-0532 after 6 p.m. ,

PUPPIES: Yorkshire terrier, 1 male, 1 female, tiny, akc, all shots, 914-235-5774 evgs.

MISC.: Mirror, 48x72, for bedrm. dresser, \$100; sofa, hand carved mahog. wood frame, tapestry fabric, upholstered, \$100; man's club chair, \$75; ladies club chair, \$75. 221-5857.

MISC.: Boy's baseball shoes, size 8; boy's bicycle, 20 in., \$25; 8 ft. pram fbgl. over wood, \$100; one new 775x14 auto tire on Chrysler rim, \$20. 261-1186.

HOUSE: Old Bethpage, 3 bedrm. ranch, brick, 60x 100, fin. basemt. w/wet bar, 2 zone nwh, ther mopane wndws., w/w. Indscpd., d.w. wash., dryer att. gar., \$39,500. 694-7255.

BOAT: 20 ft. Grady white, 265 hp. f.w.c. pamer inbd., full canvas, trim tabs, depth finder, extras. 269-4724.

OPEL: '68 Kadett LS, 2 dr. white sedan, 4 speed stick shift, radio, heater, excellent condition, \$700. 751-0845.

HOUSE: N. Great River, 3 bedrm. ranch, eat-in-kitch., att. gar., s/s, closed in porch, full cellar, Indscpd., fenced, 75x100., nr. schools, low taxes. JU 1-9343.

FIAT: '71 850 racer, 18,000 mi., am/fm, 4 spd. trans., \$1,200. 884-1476.

BICYCLE: Schwinn sting ray, boy's, 3 spd., red, \$45. 271-5583.

HOUSE: Port Jefferson Sta., 4 bedrm. hi-ranch, panel throughout, appli., 1/3 acre, wooded, Indscpd., 2 car gar., extension workshop, \$35,000. 473-9269 after 5 p.m.

BUICK: '69 Electra, low mi., new snows, must sell, best offer. 583-5134 after 5 p.m.

BOAT: '62 Thorobred, 17 gft. runabout, w/trail., '63 Evinrude elect. 40 hp., 2 gas tanks. 8 cushions, anchor and 100 ft. line, etc. \$550. 735-2649.

VW BUS: '69, 7 passenger, blue w/bk. interior, \$1,350. 273-6411.

RUG: Oriental, w/pad. 9 ft. 10 in. x 15 ft., mainly blue. PY 8-7207.

GOLF CLUBS: Lady's starter set, 1, 3 woods, 3, 5, 7, 9 irons, putter, \$30. WE 1-8322 after 6 pm.

MINK: Cape, autumn haze, 12 skins, ask. \$225. 931-4395 after 5 pm.

BUICK: '63 LeSabre, conv., r/h, 5 new tires, brks., muff., tail pipe, \$200. LI 1-4267.

MISC.: Haviland dishes, \$150; carriage robe, \$30; antique quilt, handmade, \$95. 681-5944.

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

JOHN CAMPANI of Operation Analysis and Planning, Plant 5, died May 17 at the age of 63. He had been with the Company since 1962 and lived at 22 Brookfield Rd., Northport.

STANLEY H. ANDERSON of Conventional Machines, Plant 3, died May 20 at the age of 53. He had been with the Company since March, 1956, and lived at 669 South Fourth Street, Lindenhurst.

GRUMMAN, May 25, 1973

For Sale

BABY CARRIAGE: Lg. coppertone, used twice, \$89. WE 5-0352 bet. 6-7 p.m.

FISHER: tuner, am/fm, \$25; Rek-o-kut turntbl., stereo arm and cart., \$25; tape recorder w/50 reels of tape, \$40. 543-0538.

MOTORCYCLE: Suzuki tc-100. cci auto. oil injection system, 4 gears, 208 mi., \$450. 864-1534.

SCHOOL BUS: Panel truck type, '66 Chevrolet, suit. for camping, \$350. 261-6523.

HOUSE: District No. 13, 8 rm. colonial(4 bedrms., dead end. 549-5650.

TIRES: Four G70x14 super wide sport tires, w/ rims, used 7,000 mi., \$80. 935-3427.

HOUSE: West Islip, 4 bedrms. ranch, eat-in kitch., gar., 2 baths, din. rm., center hall floor plan, fin. playrm., 26x16 panelled, laundry rm., work shp., full basemt., 85x150, fenced, patio, \$42,000. 242-1219.

WIGS: auburn shag dynel, long blonde kanekalon, long auburn human hair, inc. boxes, heads, best offer. 266-6877.

HOUSE: 4 bedrm., rustic acres, coloidal, country kitch., din. rm., main level laundry rm., basemt., fully Indscpd., 2 car gar., s/s, ohw heat, \$46,000. 928-1685.

OUTBD. MOTOR: 40 hp. Evinrude, '65, elect. start, w/controls, best offer. WE 5-0885 after 6 pm.

PICK-UP TRUCK: '62 Chevy, ½ ton, 6 cyl., 3 spd., \$650. 698-5689.

HOUSE: Shirley, 8 rm. colonial, 3 baths, 4 bedrms., 1 acre, low cash req., 281-2855.

ELDORADO: '69, loaded, \$2,500. 249-5218 days.

PUPPIES: Golden retrievers, males, \$100; females, \$125. MA 3-2081.

HOUSE: East Meadow, brick, cntr. hall, 4 bedrm., 2 bath, fam. rm., gar., fin. basemt., w/w, s/s, all appl., immed. occup., \$42,000. IV 1-0010.

CANOPY: Sears. 20 ft. x 10 ft., heavy gauge, water repellent, four adjust. poles, nylon ropes and stakes, also hardware for use on camping trailers, orig. price \$75, sell \$45. 979-6188.

MIN-BIKE: Rupp Sprint, 3½ hp., fr/rr, shocks, new clutch, surfboards, 5 ft. 11 in. design green deck, 6 ft. 11 psyche. red/blue deck, \$75. ea. 431-5716.

PIANO: Baby Grand, \$395, inc. delivery. 888-7949.

HOUSE: Farmingdale, ¼ acre., 24 ft. liv. rm., din. rm., firepl., 3 bedrms., 2 baths, eat-in kitch., slate foyer, paneling, patio, fenced, immed. occup. CH 9-2873.

MOTORCYCLE: '69 Harley-Davidson, sportster XLH, 8 in. ext. fork, 75 rr. wheel. \$1,700 firm. PE 1-4961.

IMPALA: '67, 283 cu. in., V-8, 2 dr. hdtp., 67,000 mi., r/h, new brks., \$650. 221-4742.

TRAIN SET: Lionel eng., 5 cars, curver straight trks.; hi-fi equip., 70 watt amp., 4 spd. (stereo) Garrad Turntbl., Eico fm tuner, 12 in. spkr., best offer. PY 6-5196.

HOUSE: Farmingdale, Sachem schools, 3 bedrms., ranch, lg. eat-in kitch., din. rm., w/w, carpet, expansion attic, att. gar., all appli., Indscpd., 120x 120, fenced, enc. patio, \$34,990. 732-5669.

MERCURY: '73 Marquis, station wagon, 2200 miles, metallic green. a/c, am/fm. all power, radials, posi-traction, luggage rack, warranty, \$4300. 621-4758.

HOUSE: Farmingville, 4 bdrm., ranch, 1½ bath, Cyclone fence, patio, \$29,990. 732-5759.

HOUSE: Lloyd Harbor, 2.2 acres split level, 4 bdrm., 2 bath, fireplace, terrace, barn, beach rites, school district No. 2, pvt. road, lox taxes, extras, \$75,000. After 4 p.m. HA 7-5828.

HOUSE: West Babylon, L-shaped ranch, 3 bdrm., dng. rm., 2-zone heat, o.h.w., fin. bsmt., w/w. s/s, 18 ft. pool w/deck, patio, att. gar., 80 ft. x 100 ft. fenced, low 30's. MO 9-2892.

HOUSE: Babylon Village, 2½ story col., 3 bdrm., lvg. rm., dng. rm., sun porch, mod. kit., bath, ex., \$30,000. 661-1691.

HOUSE: Commack vicinity, Cape Cod, brick and asbestos shingle, 4 bdrm., 2 full bath, fin. bsmt., wet bar, redwood deck. s/s, 3-zone heating, washer, dryer, dishwasher, conv. to stores. 864-7837.

MOBILE HOME: Calverton Park. 52 ft., full furn., ful skirting, refrig., washer, outside shed, \$7,100. After 5:30 p.m. LT 9-5785.

PLYMOUTH: '64 Fury sedan, 4 dr., 6 cyl., new tires (4), 2 new snows, \$400. 938-7359.

CHEVELLE: '68 SS 396, fm stereo, tape deck, headers, curved distributor, new tires, L-60's with deep dish chrome wheels, 375 hp, 4 spd. Hurst, ask. \$1100. After 3:00 p.m., Steve 724-0234.

SAILBOAT: Lightning #9932, fbgl.s., full floatation, self bailing, racing sails, trailer. 367-4234.

For Sale

CORVETTE: '67 Coupe 327, auto., a/c, am/fm, alarm, silver, \$2700. LI 1-3798.

TRAVEL TRAILER: 18 ft. Avalon, fully self-cont., stove, oven, refrig, bath, h.w. and space heater, sleeps 6, awning, ex., \$1875. 421-5998.

BOAT: 14 ft. Grumman alum. sail, dacron mainsail, cox trailer, \$450 for both or sell boat sep. AN 5-5118.

CADILLAC: Sedan de Ville '63, gray, all power, a/c, \$375. 585-5970.

MERCURY: '62, black, auto. trans., \$150. JU 1-1707.

CHEV.: '63 BelAir, orig. owner, 4 dr. sedan, r/h, tinted glass, 283 V-8 eng., p/s, \$200. 864-2891.

CUTLASS: '71, 4 spd. trans., 32,500 mi., \$2100. 433-6650. After 5 p.m.

BOAT: '69 Sprtcraft, fbgl.s. cabin cruiser, 27 ft., twin 160 hp, power tilt, depth finder, sniffer, am, synchronizer, deluxe int., recessed stove & sink, marine head & holding tank, sleeps 4, \$6,500. 421-5589.

TRAVEL TRAILER: 18 ft. Avalon '66, sleeps 6, 3 burner stove, oven, self-cont., 2 gas tanks, complete equip., \$1700. After 5 p.m. 226-3615.

MOTOR CYCLE: '71 Honda, 350 cc, \$500. 732-5172.

HONDA: SL-100 trail bike, low mil, Bear Knobby tires, xtra parts & tools, ask. \$400. After 6 p.m. 724-0234.

HONDA: '72, 350 cc, low mil, \$725. 796-6539. **BOAT:** Pembroke sport fisherman, 28 ft. flying bridge, '72 Chrysler 225 hp eng., fresh water cooled, full canvas, sleeps 4, ship-to-shore radio, in water, \$4200. PY 8-8773 or 799-7271.

SURFBOARD: Rick 9 ft. 6 in., no dings, ex. for beginner, \$35. 546-2549.

CAMPER: '65 Wayfarer tow-behind by Nimrod, sleeps 2-4, elec. outlets, needs canvas, have blueprints, \$50. After 6 p.m. SU 1-6495.

BOAT: '70 Tri-hull Bow-rider, fbgl.s. navy top, bow rail, 40 hp Evinrude motor, cox tilt trailer w/spare tire, Raytheon depth/finder, 12 V batt., speedometer, compass, running lights, life jackets, fire extinguisher, anchor, line, oar, flares, \$1395. 751-2449.

LOT: 100 ft. x 300 ft., Escambia Bay Estates, outside Pensacola, Fla., beach, boat launch, picnic area facilities, ask. \$4000. 884-3370.

HOUSE: Shoreham, brick cape, 4 bdrm., 2½ bath, eat-in-kit., appli. inclu., fireplace lvg. rm., bsmt.

w/w, s/s, wash/dry, porch, patio, dbl. gar. SH 4-9858.

HOUSE: N. Patchogue, 8 rm., 4 bdrm, w/w, s/s, appl., dbl. gar., park like grounds, low tax, \$38,000. 289-8068.

BUICK: '72 Skylark, 7,000 mi., 2 dr. hd. top, all power, 350 V-8, auto., air horns, gauges, snow tires, \$3,395. 731-2954.

VW: '58 w/ '66 eng., \$100. HA 7-0245.

STUDEBAKER: '64, midnite blue, evgs. WE 5-3211.

VW: '69 Squareback, auto., new brakes, 2 new tires, rear wind. defrost., 54,000 mi., ask. \$125. After 4:30 p.m. 221-8776.

GALAXIE: '65 500, 4 dr. sedan, a/c, all power, new trans., high mil, 2 xtra snows, ask. \$300. HA 3-5233.

CAPRI: '72 Model #2000, decor group auto., a/c. radial tires, 13,000 mi., \$2800. After 6 p.m. 791 8435.

CADILLAC: '55 2 dr., could be restored to classic cond. for profit or hobby. Evgs. 626-0843.

PLYMOUTH: '67 Fury III wagon, 9 pass., auto. trans., r/h, tinted window, roof rack, remote mirror, \$1250. HR 3-1583.

CHEV.: '70 BelAir, 4 dr. sedan, orig. owner, \$1675. 549-5332.

CHEV.: '68 Camaro, 6 cyl., new batt., snows, orig. owner, 31,000 mi., \$1100. 293-6157.

FORD: '63 Fairlane, 4 dr. sedan, auto. trans., 6 cyl., after 4 p.m. MO 5-3319.

CADILLAC: '67 convert., white, blk. top, red int., 59,000 mi., \$1400. CA 1-2219.

MUSTANG: '65 (2+2), 3 spd., tach., ask. \$500. Days HA 1-3661/evgs. HA 7-0384.

HOUSE: Bethpage, 3 bdrm., brick ranch, eat-in-kit., detached gar., 98 ft. x 80 ft. corner, low taxes, \$34,000. 433-9255.

TV: Webcor color port.. 19 in.; RCA b/w console, 25 in.; Magnavox, b/w console, 24 in. Best reasonable offer. FL 4-1050.

MISC.: 16 in. AMF Roadmaster Javelin Jr., boy-girl tank, trng. wheels, \$18; 16 in. Columbia tricycle, \$12; 3 burner kerosene stove on legs, \$15; Remington typewriter, old stand. #10, \$15. FO 8-6752.

For Sale

MISC. FURN.: kit. table, 4 chairs, leaf, formica top & chrome legs, yell., \$20; dng. rm. table, leaf, 4 chairs, china c'oset, credenza, \$125; bdrm. wheat color, mod.; dble. dress, chest of drawers, night tables, \$85. After 4 p.m. 785-1037.

MOTORCYCLE: Hodaka 100 cc, custom wheels, knobby tires & seat, exp. chamber, overlay sprocket, xtras, \$195; Midget/Sprite parts, custom air cleaners, gauges, rear end, rack, custom seat, \$20. PY 8-4258.

TRAILER: '71 Continental travel, 18 ft. sleeps 6, self-cont., stove/oven, ref/freeze., heat, awning, sway control, spare, xtras, \$2750. 587-0456.

CAMERA: Asahi Pentax Spotmatic, Fl.4 super Takoman lens, 1/1000 sec. shutter; Yashinon f2.8-50 mm lens, f3.5-155 mm telephoto lens, 2 x adapter lens, lens hoods, Tripod Vivitar strobe w/power supply, carrying case, shutter cable, \$275. 727-7831.

HAIRDRYER: Presto mist, xtra lge. hood, remote control, 3 spd., travel case, Ask. \$20. 781-8653.

CHEV.: '67 Impala, 2 dr. hd. top, a/c, 283 eng., all power, \$650. 694-7555.

BOAT: 21 ft. Trojan cabin cruiser, galley, head, s/lps. 3, bow rails, full canva's, Johnson 115 hp, ready for water, \$1,350. 751-1706.

TIRES: Rambler snow, 2, rim, \$25. JU 6-0182.

POOLSIDE: 4 ft. above ground pool, all steel, \$20. After 4:30 p.m. TU 8-5177.

HOUSE: Oakdale, 12 room Dutch col., w/w, suitable mother/dght., 1½ years old, \$65,000. 567-3697.

HOUSE: Babylon, 15-yr.-old Cape, 100 ft. x 122 ft. fenced. 4 bdrm., 2 full bath, eat-in-kit, bsmt., wood-burn fireplace, dng. rm, 16 ft. x 32 ft. in-pool, patio, wishing well, bar-b-q, all appl, \$41,500. 587-2359.

HOUSE: Plainview, Hi-ranch, 9 rooms, 4 bdrm., 2 dens, Broadloom, 2½ bath w/tile, fireplace, 2 car gar., Indscpd, underground sprinklers, xtras. After 8 p.m. (212) 366-7530.

HOUSE: Deer Park, hi-ranch, 3-4 bdrm., lvg. rm., dng. rm., 1½ bath, patio, paneling, xtras, cul-de-sac, low taxes, \$39,000. 586-6088.

HOUSE: Cocoa, Fla., 5 rms., 1 bath, 2 car. gar., zone for duplex, 50 ft. x 118 ft., \$15,000. Ext. 2858, Tony.

LAND: Islip Manor, 50 ft. x 125 ft. w/2 car gar.. water & gas, near school & railroad station, \$8000. Ext. 2858., Tony.

LOT: Florida., ½ acre lot, Lehigh Acres on West Coast near Fort Myers, cul-de-sac corner, fronting small canal, utilities in to property line membership priv. in golf club near shops. 261-8790.

HOUSE: Old Bethpage 3 bdrm. ranch brick 60 ft. x 100 ft., fin. bsmt.. wetbar, 2 zone o.h.w., w/w, Indscpd., wash/dryer, att. gar., centrally loc., \$39-, 500. 694-7255.

HOUSE: N. Massapequa, col. split, 4 bdrm, 1½ bath, dng. rm., lvg. rm., bsmt., extended gar., fully Indscpd., 75 ft. x 100 ft., \$41,500. MY 4-6044.

BUICK: '70 Electra 225, all pwr., a/c, am-fm stereo, tape deck, 60/40 seat, 4 new tires, \$2,550. 643-7210 after 5 p.m.

PONTIAC: '64 Catalina, p/s, p/b, auto., new front end & brks., \$250. 261-4816.

plane GRUMMAN news

Published twice a month for the employees of Grumman Aerospace Corporation, Bethpage, N. Y. 11714, as a function of the Public Affairs Dept., Vice President J. B. Rettallata, director.

Manager, Internal Communications
Brian Masterson

Managing Editor
Charles Petty

Feature Editor
Al Wehren

Editorial Assistants
Kathy Housley
Cynthia McCaskiel

Telephone
Plane News: 3293
Plane News from outside line:
LR 5-3293

Grumman team supporting BIS finds days get longer and longer

PATUXENT RIVER, MD.—Jim Russell has been at the Naval Air Test Center here for eight years as base manager for Grumman, and he can't remember when it was ever busier.

There are three types of aircraft—F-14 Tomcat, E-2C Hawkeye, and EA-6B "Expanded Capability" Prowler—at Patuxent River for BIS (Board of Inspection and Survey) trials, and the Grumman support team at the test center has been getting larger and larger to keep pace with the effort. In addition to a full-time staff of 10, Russell now has about 230 more people here, and there's no end yet in sight.

A look at the BIS schedule of the F-14 Tomcat, for example, might provide some insight as to how extensive that testing will become. At present, there are two F-14s at Patuxent, but in the future that number will be increased to four, with the trials involving weapons system test, flight test (flying qualities and performance), carrier suitability, structural test, and service test (reliability and maintainability).

Wide range of skills

Naturally, the support provided for the three aircraft (and any other Grumman planes the Navy may be using in its various test programs) includes just about all the technical skills: airframe, hydraulic, avionics, weapons systems specialists from manufacturing; structural and systems engineers; and flight test engineers.

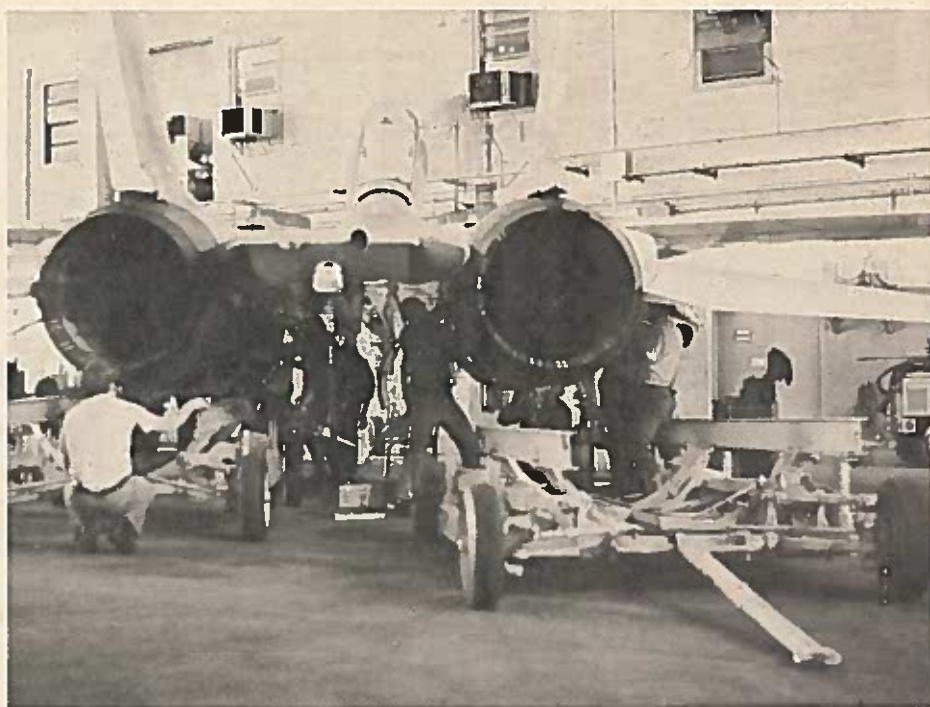
And as Russell points out, going "on the road" for the Company can allow an individual to get a different view of the world, but it usually is very hard work too, especially at BIS time. "Our day can stretch anywhere from eight to 12 to 18 hours," says Russell, "and when things get real hot, we

sometimes have to work seven days a week."

BIS trials have been compared by Capt. Ken Melin, senior member of the Navy board, to giving an airplane its final examinations before it is introduced to Fleet service. "We're looking at how well an aircraft meets its contract specifications and its overall suitability for the mission for which it was procured."

To do that, he explained, the Board of Inspection and Survey conducts the trials with the assistance of Navy personnel at Patuxent River. Although Grumman provides the technical support necessary for the BIS trials, members of Weapons Systems Test, Flight Test, and Service Test at the Naval Air Test Center perform the flight testing and evaluation of the aircraft and its various systems. They report their findings through their various directors to the Board of Inspection and Survey, who, in turn, inform the contractor as to what corrective actions, if any, are necessary before a plane or system is certified for introduction to the Fleet.

"Patuxent is a great place to be," says Russell. "This is the place where you can see everything that's new



Quick change. Grumman support team at Patuxent is supporting three different BIS programs, and there are times when they must become quick-change artists to keep aircraft in 'up' status.

'cause eventually they all arrive here from Navy contractors for extensive testing. But at BIS time it can get especially hot because we have to respond to all types of situations — and how smoothly the BIS trials go can depend to a large extent on how well we do our jobs.

"A lot of people don't really understand what it is to be working away

from home: the facility isn't your own, and you don't always have all the parts or technical support you need. You might compare it to camping out — no matter how well you stock a campsite, it's never got all the comforts of home. So when we have problems, we really appreciate — depend on — all the help we can get from home base."

Stepping up tempo on Shuttle Orbiter effort

A Grumman team headed by Al Kemp is now in California at the Downey Space Division of Rockwell International working on the Phase I project for the preliminary design of the Space Shuttle orbiter wing structure.

Earlier this month, some 14 Grummanites and their families left Bethpage for Downey; a total of 50 will eventually be assigned there on the wing program. The Phase I activity is scheduled to stretch over a five-month

period during which time Grumman will conduct in-depth trade studies of structural design options to refine and confirm the baseline design configuration. Included will be such matters as developing load paths, selecting materials, performing structural sizing, and determining the weight of each design option.

"Now that Phase I is under way we're looking forward to the start of Phase II," says Don Markarian, Grumman Shuttle manager. "That involves the production design and fabrication of wing units here at Bethpage."

The current work on the Shuttle-Orbiter wing is not the only work-tie the Company has with Rockwell. There is an ongoing Shuttle wind-tunnel model program at Bethpage that's being led by John Adornato, assisted by a team including Bill Gander of Aero Test and Mike Larkin of Manufacturing.

According to Gander, "We're in the process of developing 18 different types of wind-tunnel test models of the Shuttle at the request of Rockwell. Three of the models have been delivered so far. Extensive wind tunnel testing of these models will be done at various test facilities."

The scale models were fabricated by Plants 2 and 3 machine shops, Plant 5 model shop, Plant 11 plaster shop, and Plant 14 thermo lab.

The Orbiter wing that Grumman will develop will have a "double delta" design — an initial 75-degree sweep from the fuselage and then a 45-degree sweep leading to the tip. The wing will be made in two panels totaling about 2,100 square feet of surface and a combined weight of approximately 14,000 pounds. Each wing panel will measure some 34 feet from tip to fuselage and will be about 62 feet wide where it meets the fuselage.

"We are pleased to have been selected by Rockwell to develop their Orbiter Wing," comments Don Markarian, "and we are eagerly awaiting the start of several additional competitions to be conducted by Rockwell for other elements of the Orbiter. We believe that we can make additional significant contributions to the Space Shuttle Program."

It's that time again . . .

. . . To thinking about putting one—hopefully not two—day aside for the Grumman Family Picnic. This year, according to Gus D'Errico of Employee Services, the big day has been set for Saturday, July 21. Put that date on your calendar—and buy tickets, \$2.50 each, all under 12 free.

In case you've forgotten, the spacious and shaded picnic grounds are located at the Calverton facility.

GRUMMAN, May 25, 1973

GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK 11714

**BULK RATE
THIRD CLASS
PERMIT NO. 264
U.S. POSTAGE PAID
BETHPAGE, NEW YORK**